Docket No.: 245498US41X DIV

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COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

RE: Application Serial No.: 10/717,465
Applicants: Alexandre CORJON, et al.
Filing Date: November 21, 2003
For: METHOD FOR ACCELERATING DESTRUCTION OF A VORTEX FORMED BY A WING OF AN AIRCRAFT
Group Art Unit: 3644
Examiner: Holzen, S.

SIR:

Attached hereto for filing are the following papers:

APPEAL BRIEF WITH APPENDICES

Our credit card payment form in the amount of **$500.00** is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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DOCKET NO. [illegible]498US41X DIV

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:
ALEXANDRE CORJON, ET AL.	: EXAMINER: HOLZEN, S.
SERIAL NO: 10/717,465	:
FILED: NOVEMBER 21, 2003	: GROUP ART UNIT: 3644
FOR: METHOD FOR ACCELERATING DESTRUCTION OF A VORTEX FORMED BY A WING OF AN AIRCRAFT	:

APPEAL BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

This is an appeal from the decision of the Examiner dated September 8, 2006, which finally rejected Claims 1, 2, 6-13, 17-19, 23-28, 30, and 31 in the above-identified patent application.

I. REAL PARTY-IN-INTEREST

The real part-in-interest is Airbus France S.A.S.

II. RELATED APPEALS AND INTERFERENCES

U.S. Application No. 10/717,672, which also claims priority to U.S. Patent Application No. 10/080,407, is also under appeal.

III. STATUS OF CLAIMS

Claims 1, 2, 6-13, 17-19, 23-28, 30, and 31 have been finally rejected and form the basis for this appeal. Claims 3-5, 14-16, 20-22, and 29 are withdrawn. Appendix VIII includes a clean copy of appealed Claims 1, 2, 6-13, 17-19, 23-28, 30, and 31.

IV. STATUS OF AMENDMENTS

No amendments after final rejection have been filed.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1 is directed to a method for accelerating a destruction of a vortex formed at a rear of a wing of an aircraft by a merging of first and second co-rotating eddies. The method includes generating a periodic perturbation adjacent an area of creation of the first eddy. The periodic perturbation has a predetermined wavelength that excites at least one internal instability mode of a core of the first eddy. This method is described in the specification from page 7, line 24 to page 10, line 16, as illustrated by Figure 1. First co-rotating eddy 7A merges with second co-rotating eddy 8A to form vortex 5A at a rear portion of wing 3A. Perturbation device 11 generates a periodic perturbation adjacent an area of creation 10A of the first eddy 7A. The periodic perturbation has a predetermined wavelength that excites at least one internal instability mode of a core of the first eddy 7A.

Independent Claim 7 is directed to a method for accelerating a destruction of a vortex formed at a rear of a wing of an aircraft by a merging of first and second co-rotating eddies. The method includes emitting a jet of fluid transverse to a direction of travel of the aircraft. The jet of fluid causes a periodic perturbation having a predetermined wavelength that excites at least one instability mode of the first eddy. This method is described in the specification from page 7, line 24 to page 10, line 16 and page 14, lines 11-21, as illustrated by Figures 1

and 3. First co-rotating eddy 7A merges with second co-rotating eddy 8A to form vortex 5A at a rear portion of wing 3A. Perturbation device 12 emits a jet of fluid 15 transverse to a direction of travel of the aircraft. The jet of fluid 15 causes a periodic perturbation having a predetermined wavelength that excites at least one instability mode of the first eddy 7A.

Independent Claim 10 is directed to a method for accelerating a destruction of first and second contra-rotating vortices formed at a rear of first and second wings of an aircraft. The first contra-rotating vortex is formed by a merging of first and second co-rotating eddies. The second contra-rotating vortex is formed by a merging of third and fourth co-rotating eddies. The method includes generating a first periodic perturbation adjacent an area of creation of the first eddy, and generating a second periodic perturbation adjacent an area of creation of the third eddy. The first periodic perturbation has a first predetermined wavelength that excites at least one internal instability mode of a core of the first eddy. The second periodic perturbation has a second predetermined wavelength that excites at least one internal instability mode of a core of the third eddy. This method is described in the specification from page 7, line 24 to page 10, line 16, as illustrated by Figure 1. First co-rotating eddy 7A merges with second co-rotating eddy 8A to form first vortex 5A at a rear portion of first wing 3A. Third co-rotating eddy 7B merges with fourth co-rotating eddy 8B to form second vortex 5B at a rear portion of second wing 3B. First perturbation device 11 generates a first periodic perturbation adjacent an area of creation 10A of the first eddy 7A. The first periodic perturbation has a predetermined wavelength that excites at least one internal instability mode of a core of the first eddy 7A. Second perturbation device 11 generates a second periodic perturbation adjacent an area of creation 10B of the third eddy 7B. The second periodic perturbation has a predetermined wavelength that excites at least one internal instability mode of a core of the third eddy 7B.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are:

(a) whether Claims 1, 2, 6-10, 18, 19, 23-28, 30, and 31 are anticipated under 35 U.S.C. §102(b) by Yuan (U.S. Patent No. 3,936,013), or in the alternative, are unpatentable under 35 U.S.C. §103(a) over Yuan in view of ordinary skill in the art; and

(b) whether Claims 11-13 and 17 are unpatentable under 35 U.S.C. §103(a) over Yuan in view of ordinary skill in the art.

VII. ARGUMENTS

A. Introduction

Claim 1 recites, *inter alia*, a method for accelerating a destruction of a vortex, comprising:

> generating a periodic perturbation adjacent an area of creation of the first eddy, the periodic perturbation having a predetermined wavelength that excites at least one internal instability mode of a core of the first eddy.

Claim 7 recites, *inter alia*, a method for accelerating a destruction of a vortex, comprising:

> emitting a jet of fluid transverse to a direction of travel of the aircraft, the jet of fluid causing a periodic perturbation having a predetermined wavelength that excites at least one instability mode of the first eddy.

Claim 10 recites, *inter alia*, a method for accelerating a destruction of a vortex, comprising:

> generating a first periodic perturbation adjacent an area of creation of the first eddy, the first periodic perturbation having a first predetermined wavelength that excites at least one internal instability mode of a core of the first eddy; and
> generating a second periodic perturbation adjacent an area of creation of the third eddy, the second periodic perturbation having a second predetermined wavelength that

> excites at least one internal instability mode of a core of the third eddy.

B. Claims 1, 2, 6-13, 17-19, 23-28, 30, and 31 are not anticipated by or unpatentable over Yuan

The outstanding Office Action stated:

> The examiner re-asserts that the phrase "excites" is a desired outcome of the "generating" step. The limitation "excites" is not an individual method step. The limitation excites is limiting only in the sense that the prior art method steps must be capable of exciting the at least one instability mode to read on the limitation. It is the examiner's position that Yuan teaches this capability.[1]

However, the outstanding Office Action does not cite any authority for ignoring the claim feature "the periodic perturbation having a predetermined wavelength that excites at least one internal instability mode of a core of the first eddy." In fact, ***all*** words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). Therefore, in the present case, it is respectfully submitted that a method as described by Yuan does ***not*** generate a perturbation ***having a predetermined wavelength that excites at least one internal instability mode of a core of the first eddy***. Thus, Yuan does not teach "generating a periodic perturbation" as defined in Claim 1.

It is further respectfully submitted that Yuan does not in any way suggest generating a perturbation having a predetermined wavelength that excites at least one internal instability mode of a core of the first eddy. In fact, Yuan does not teach or suggest generating a perturbation having ***any*** predetermined wavelength, much less a wavelength that excites at least one internal instability mode of a core of the first eddy. Yuan describes a device that extends from the tip of an aircraft and provides a flow of air opposite to a vortex formed at

[1] See the outstanding Office Action at page 2, lines 12-16.

the wingtip to cancel out such a vortex.[2] Thus, Yuan does not teach or suggest "generating a perturbation" as defined in Claim 1.

The outstanding Office Action conceded that Yuan does not teach generating a perturbation having a wavelength that excites at least one internal instability mode of a core of the first eddy, but concluded that it would have been obvious to select a wavelength that excites at least one internal instability mode of a core of the first eddy.[3] As noted in the outstanding Office Action, well settled case law holds that a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). See also MPEP §2144.05. The outstanding Office Action apparently concluded that Yuan has identified a wavelength of a perturbation as a result effective variable, but did not cite any portion of Yuan to support this conclusion. However, it is respectfully submitted that Yuan does not identify a wavelength of a perturbation as a result effective variable. In fact, it is respectfully submitted that Yuan does not even mention a wavelength of a perturbation. Accordingly, a *prima facie* case of obviousness has not been made with respect to Claim 1.

Accordingly, it is respectfully submitted that Claim 1 (and Claims 2, 6, 18, and 19 depending therefrom) is patentable over Yuan.

With regard to Claim 7, Yuan does not in any way teach or suggest generating a periodic perturbation having a predetermined wavelength that excites at least one instability mode of the first eddy by any means, much less generating such a perturbation with a jet of fluid. Accordingly, it is respectfully submitted that Claim 7 (and Claims 8, 9, and 23-26 depending therefrom) is patentable over Yuan.

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[2]See Yuan, column 2, lines 17-28.
[3]See the outstanding Office Action at page 2, lines 12-16.

With regard to Claim 10, Yuan does not in any way teach or suggest generating a periodic perturbation having a predetermined wavelength that excites at least one instability mode of the first eddy, much less generating two such perturbations. Accordingly, it is respectfully submitted that Claim 10 (and Claims 11-13, 17, and 27-31 depending therefrom) is patentable over Yuan.

Conclusion

It is respectfully requested that the outstanding rejections be REVERSED.

Respectfully submitted,

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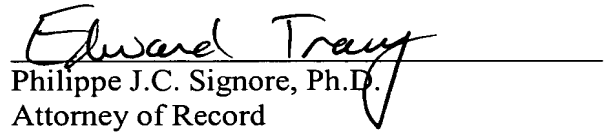

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VIII. CLAIMS APPENDIX

Claim 1: A method for accelerating a destruction of a vortex formed at a rear of a wing of an aircraft by a merging of first and second co-rotating eddies, the method comprising:

generating a periodic perturbation adjacent an area of creation of the first eddy, the periodic perturbation having a predetermined wavelength that excites at least one internal instability mode of a core of the first eddy.

Claim 2: The method according to claim 1, wherein the generating step comprises generating the periodic perturbation in an area adjacent a flap of the wing.

Claim 6: The method according to claim 2, further comprising:

emitting a jet of fluid from the area adjacent the flap of the wing.

Claim 7: A method for accelerating a destruction of a vortex formed at a rear of a wing of an aircraft by a merging of first and second co-rotating eddies, the method comprising:

emitting a jet of fluid transverse to a direction of travel of the aircraft, the jet of fluid causing a periodic perturbation having a predetermined wavelength that excites at least one instability mode of the first eddy.

Claim 8: The method according to claim 7, wherein emitting the jet of fluid includes emitting a jet of fluid at a velocity at least equal to a velocity of the aircraft.

Claim 9: The method according to claim 8, wherein emitting the jet of fluid

includes emitting a jet of fluid from one of the wing and a flap of the aircraft.

Claim 10: A method for accelerating a destruction of first and second contra-rotating vortices formed at a rear of first and second wings of an aircraft, the first contra-rotating vortex being formed by a merging of first and second co-rotating eddies, and the second contra-rotating vortex being formed by a merging of third and fourth co-rotating eddies, the method comprising:

generating a first periodic perturbation adjacent an area of creation of the first eddy, the first periodic perturbation having a first predetermined wavelength that excites at least one internal instability mode of a core of the first eddy; and

generating a second periodic perturbation adjacent an area of creation of the third eddy, the second periodic perturbation having a second predetermined wavelength that excites at least one internal instability mode of a core of the third eddy.

Claim 11: The method according to claim 10, wherein the generating step comprises generating the first and second periodic perturbations so that diameters of the first and second vortices are greater than a predetermined proportion of a distance between the first and second vortices.

Claim 12: The method according to claim 11, wherein the generating step comprises generating the first and second periodic perturbations so that the diameters of the first and second vortices are greater than about 30% of the distance between the first and second vortices.

Claim 13: The method according to claim 12, wherein the generating step comprises generating the first and second periodic perturbations in areas adjacent first and second ~~flap~~ flaps of the first and second wings.

Claim 17: The method according to claim 13, further comprising:

emitting first and second jets of fluid from the areas adjacent the first and second flaps of the first and second wings.

Claim 18: The method according to claim 1, wherein the periodic perturbation corresponds to the vortex's Benard-von Karman instability.

Claim 19: The method according to claim 1, wherein the periodic perturbation induces an increase in three-dimensional elliptic instabilities.

Claim 23: The method according to claim 7, wherein the periodic perturbation corresponds to the vortex's Benard-von Karman instability.

Claim 24: The method according to claim 7, wherein the generating step comprises generating the jet of fluid from a flap of the aircraft.

Claim 25: The method according to claim 7, wherein the periodic perturbation induces an increase in three-dimensional elliptic instabilities.

Claim 26: The method according to claim 7, wherein, when the jet of fluid is emitted orthogonally to a flow around the wing, a velocity of the jet of fluid must be

at least equal to a velocity of the aircraft.

Claim 27: The method according to claim 10, wherein the first and second periodic perturbations correspond to the vortex's Benard-von Karman instabilities.

Claim 28: The method according to claim 10, wherein the first and second periodic perturbations induce an increase in core diameters of the co-rotating eddies.

Claim 30: The method according to claim 10, wherein the first and second periodic perturbations induce increases in three-dimensional elliptic instabilities.

Claim 31: The method according to claim 10, wherein the internal instability mode to be excited is determined from a ratio between the sizes of the cores of the eddies and the distance between the eddies.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

No decision has been rendered in the appeal of U.S. Patent Application No. 10/717,672.